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Indian Standard

METHOD FOR DETERMINATION OF WETTABILITY OF COTTON FABRICS

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METHOD FOR DETERMINATION OF WETTABILITY OF COTTON FABRICS

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Indian Standard

METHOD FOR DETERMINATION OF WETTABILITY OF COTTON FABRICS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 26 April 1963, after the draft finalized by the Textile Chemistry Sectional Committee had been approved by the Textile Division Council.

0.2 In the cotton textile industry the fabrics undergo treatment of scouring prior to bleaching and other finishing treatments. By scouring treatment the cotton material is made more absorbent. Wettability is a very important property of all textile materials. Bleaching, dyeing, and finishing of textiles are dependent among others on the wettability of the material. It is expected that the method of test prescribed in this standard would be of use for determining the wettability of cotton textile materials.

0.3 Taking into consideration the views of producers, consumers and testing authorities, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the manufacturing and testing practices followed in the country in this field. Furthermore, due weightage had to be given to the need for co-ordination among standards prevailing in different countries of the world in this field. These considerations led the Sectional Committee to derive assistance from B.S. Handbook No. 11-1956 Methods of Test for Textiles issued by the British Standards Institution.

0.4 Wherever a reference to any Indian Standard appears in this standard, it shall be taken as a reference to the latest version of the standard.

0.5 Metric system has been adopted in India and all quantities and dimensions in this standard have been expressed in this system.

0.6 In reporting the result of a test made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS:2-1960 Rules for Rounding Off Numerical Values (*Revised*).

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1. SCOPE

1.1 This standard prescribes a method for the determination of wettability of cotton fabrics. This method is also applicable for assessing the efficiency of scouring.

2. PRINCIPLE

2.1 A drop of water is allowed to fall on the test specimen. A lamp is suitably placed so that the image of the lamp is seen on the drop. The time taken for the image of the lamp to just disappear at the edge of the drop is noted. This time is a measure of the wettability of the sample under test.

NOTE — The longer the time taken, the lower is the wettability.

3. TERMINOLOGY

3.1 For the purpose of this standard, a 'lot' shall mean the quantity of cotton fabric purporting to be of one definite type and quality delivered to one buyer against one despatch note.

4. SAMPLING

4.1 Sample to determine wettability of a lot of the material shall be selected so as to be representative of the lot.

4.2 Sample drawn in accordance with an agreement between the buyer and the seller to determine the wettability of a lot of the material shall be held to be representative of the lot.

4.3 In case of dispute as to whether the material in a lot conforms to the standard or not and there being no agreed method of drawing its representative sample, the sample selected to represent the lot shall consist of fabric from bales constituting the early, middle and late parts of the lot in order of time of delivery, or in the case of single delivery, in order of serial numbers of bales. The fabric selected shall be not less than 1 percent nor more than 10 percent of the lot by weight and shall be selected from bales constituting not less than 10 percent nor more than 50 percent of the lot. The fabric so drawn shall constitute the **test sample.**

5. ATMOSPHERIC CONDITIONS FOR TESTING

5.1 Unless otherwise provided for in an agreement between the buyer and the seller, all tests shall be carried in a standard atmosphere at 65 ± 2 percent relative humidity and 27° ± 2°C temperature (*see also* *IS:195-1950 Atmospheric Conditions for Testing) or within a period of 5 minutes of the removal of the test specimen from the standard atmosphere.

6. CONDITIONING OF TEST SPECIMENS

6.1 Prior to evaluation, the test sample (or the test specimens drawn therefrom) shall be conditioned to moisture equilibrium (*see* **5.1**), unless otherwise provided for in an agreement between the buyer and the seller.

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*Since revised.

7. PREPARATION OF TEST SPECIMENS

7.1 From the test sample drawn as in **4.2** and **4.3**, draw at random a 20 × 20 cm test specimen such that at least five test specimens are taken. Treat these test specimens with distilled water at 30°C, with a material to liquor ratio of 1 : 50 for 30 minutes. Then remove the moisture present in the test specimens by pressing them between folds of filter paper and dry them at room temperature.

7.2 Take one test specimen treated as in **7.1**, and mark on it, preferably in the middle, by means of marking pencil a square measuring 10 × 10 cm. Subdivide the square into 25 small squares, each measuring 2 × 2 cm.

8. APPARATUS

8.1 An apparatus consisting of a base on which are fixed:

a) an arm which carries

  1) a boss holding a small burette which is provided preferably with a metal edge, that is, a tip of external diameter 1·2 mm; and

  2) a housing containing an electrical lamp;

b) a viewing ring which is adjustable for height corresponding to the length of the specimen to be examined.

8.2 Wooden Embroidery Frame — 15 cm in diameter.

8.3 Stop-Watch — reading correct to one-tenth of a second.

NOTE — A reciprocal time scale reading up to two revolutions superimposed on the ordinary scale is very convenient.

9. REAGENTS

9.1 Distilled Water — conforming to IS : 1070-1960 Water, Distilled Quality (*Revised*).

10. PROCEDURE

10.1 Mount the test specimen on the embroidery frame so as to have a taut surface.

10.2 Switch on the electric lamp of the apparatus. Fill the burette with distilled water. Place the test specimen mounted on the frame on the base of the apparatus. Adjust the height of the burette such that the surface of the cloth is just two drops beneath the edge of the burette, and that the drop falls on one of the squares.

10.3 Allow a drop to fall on the specimen and, at the same time, start the stop-watch. Observe the image of the lamp on the face of the drop through the viewing ring. When the image disappears at the edge of the drop, stop the stop-watch. From the two readings observed, calculate the time, in seconds, taken for the image of the lamp to disappear at the edge of the drop.

NOTE — The end-point is determined by placing the viewing ring between the observer and a source of light, such as a window, at such an angle that the specular reflection of the light from the surface of the flattened drop can be plainly seen. As the drop is gradually absorbed, the area of this tiny mirror diminishes and finally vanishes entirely leaving only a dull wet spot behind. The stop-watch is stopped at this moment.

10.4 Repeat the procedure prescribed in **10.3** with the remaining squares in the specimen.

10.5 Calculate the average of all the values obtained as in **10.3** and **10.4**.

10.6 Repeat the procedure prescribed in **10.1** to **10.5** with the remaining test specimens.

10.7 Calculate the average of all values obtained as in **10.5** and **10.6**.

11. REPORT

11.1 Report the average value obtained (*see* **10.7**) as the wettability of the fabric in the lot in terms of seconds.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	2 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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